IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OKLAHOMA

STATE OF OKLAHOMA, *et al.*	)	
	)	
Plaintiffs,	)	
	)	
v.	)	**Case No. 4:05-cv-00329-GKF-SAJ**
	)	
TYSON FOODS, INC., *et al.*	)	
	)	
Defendants.	)	

Declaration of James Chadwick

The undersigned, James Chadwick, does hereby declare:

1. I received a Bachelor of Science degree in Fish and Wildlife Management in 1972 and a Master of Science degree in Fisheries Management in 1974, both from Montana State University. I am currently certified as a Fisheries Scientist, and have been continuously certified as such since 1983, by the American Fisheries Society.

2. I am Senior Ecologist, Senior Vice President, and Director of the Ecological Division of GEI Consultants, Inc., an engineering and ecological consulting company. Previously, I directed my own ecological consulting firm, Chadwick Ecological Consultants, Inc., which I founded in 1979 and which grew to a staff of 30 scientists and support staff. GEI acquired Chadwick Ecological in August 2006.

3. Over the past 33 years I have served as Principal Investigator, Project Manager, and Principal in Charge on numerous projects determining the effects of human activity on aquatic populations. I have published over 27 papers in peer reviewed journals and symposia proceedings, and have made numerous presentations regarding the results of my studies and conclusions. I have authored many technical reports for a variety of clients and projects in the United States.

4. I have been retained by the Defendants in this matter to address issues pertaining to aquatic ecology. To that end I have reviewed the declarations produced by Dr. Jan Stevenson and Dr. Scott Wells, among others.

5. In his report, Dr. Stevenson's employs aquatic ecology to assess the health of waterways. Specifically, Dr. Stevenson analyzes the aquatic ecological community in waterways within the IRW to assess biotic communities at reference and target sites.

6. I have reviewed Dr. Stevenson's summary report, but I have not yet reviewed the full set of the underlying data that form the basis of his report because some of this data was only

recently produced to Defendants. I have therefore not yet had an opportunity to review the complete data underlying the report to confirm that it has all been produced.

7. Having now reviewed Dr. Stevenson's report, and in particular being able to see now the samples upon which he replies, it is clear that in order to respond fully I may need to conduct some sampling of my own. This is because, based on my preliminary assessment, the sample set upon which Dr. Stevenson relies appears to be inadequate to support an analysis of this kind.

8. In order to characterize the benthic and fisheries ecology of a waterway, it is ideal to take samples during several seasons. This is because aquatic communities display a high level of seasonality. This is true as to both the particular species as well as abundances that sampling will detect.

9. For example, most macroinvertebrates that inhabit streams have a lifecycle during which they hatch, develop, emerge, take flight, and reproduce. Where multiple species are present, these lifecycles are not perfectly matched. Rather, they generally have developed so as to be staggered. Hence, samples taken at any given point will capture only those macroinvertebrates at a stage of development susceptible to sampling. For example, invertebrate sampling is typically conducted using a 500 micron mesh net. Only macroinvertebrates that have hatched and grown large enough to not pass through the net, yet which have not yet taken flight, will be captured. Other species either earlier or later in the developmental process will be underrepresented. Also, sampling done only during the summer may undercount whatever species are present because many species may be either in the adult flying stage or in recently-deposited egg and early instar stages. Therefore, sampling only during the next few months from now would risk undercounting the total extent of the macroinvertebrate community.

10. To accurately characterizing the benthic and fisheries ecology, sampling over multiple seasons also accurately characterizes the conditions impacting the stream by accounting for both high and low flow conditions. Depending on the specific waterway, high and low flow conditions can have different effects. During low flow conditions, where water levels are at their lowest, levels of contaminants may be most concentrated and therefore overstated. Conversely, during high flow conditions, there is more water present to dilute the levels of contaminants. But, high flow conditions can also overstate contaminants by adding materials to the river that are not usually present, such as material from urban storm systems. Sampling over a longer period smoothes out these peaks and troughs. Sampling during only one season, conversely, risks misrepresenting average levels of constituents in the water.

11. In addition, in order to respond to Dr. Stevenson's report it may be necessary to assess the sites from which his samples were taken. This is true for both reference and target sites. Simply put, a sample is only as good as the location from which it came.

12. Moreover, Dr. Stevenson has apparently relied on qualitative biological data. I may wish to collect quantitative data to better define the complex relationships between biota and their environment.

13. Finally, as is the case with several of my colleagues, before I can complete my review of Dr. Stevenson's report, I will first need to review Dr. Bierman's conclusions regarding plaintiffs' modeling of the watershed. Dr. Stevenson shows that the aquatic ecology issues are linked to plaintiffs' model, as he relies on Plaintiffs' models in developing his own conclusions. *See, e.g.*, Stevenson Report p. 47. Until Dr. Bierman has identified any inaccuracies or flawed assumptions underlying those models, I cannot fully assess Dr. Stevenson's conclusions relying thereupon.

14. Assuming diligent work on my part, I believe that I can complete a benthic and aquatic ecology study by May 30, 2009.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on June 10, 2008

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